

CLAIMS

1. An isolated nucleic acid molecule encoding a polypeptide comprising an amino acid sequence substantially as set forth in SEQ ID NO:2 or an amino acid sequence having at least about 71% similarity to SEQ ID NO:2, wherein said polypeptide is present in plant zygotic embryos or embryogenic callus and is substantially not present in non-embryogenic tissue.
2. An isolated nucleic acid molecule of Claim 1, wherein said nucleic acid molecule comprises a sequence of nucleotides substantially as set forth in SEQ ID NO:1 or SEQ ID NO:3 or its complementary form, or a nucleotide sequence having at least about 71% similarity to SEQ ID NO:1 or SEQ ID NO:3 or its complementary form or a nucleotide sequence capable of hybridizing to SEQ ID NO:1 or SEQ ID NO:3 or its complementary form under low stringency conditions.
3. An isolated nucleic acid molecule of Claim 1, wherein the nucleic acid molecule is developmentally regulated.
4. An isolated nucleic acid molecule of Claim 1, 2 or 3, wherein the nucleic acid molecule is expressed substantially in embryogenic material of oil-palm plants or related plants but not in non-embryogenic material.
5. An isolated nucleic acid molecule of Claim 1, wherein the nucleic acid molecule comprises the nucleotide sequence substantially as set forth in SEQ ID NO:1 or SEQ ID NO:3.
6. An isolated nucleic acid molecule of Claim 1, wherein the nucleic acid molecule comprises the nucleotide sequence substantially as set forth in SEQ ID NO:1.
7. An isolated nucleic acid molecule of Claim 1, wherein the nucleic acid molecule comprises the nucleotide sequence substantially as set forth in SEQ ID NO:3.

8. A genetic construct comprising a nucleic acid molecule encoding a polypeptide comprising an amino acid sequence substantially as set forth in SEQ ID NO:2 or an amino acid sequence having at least about 71% similarity to SEQ ID NO:2, wherein said polypeptide is present in plant zygotic embryos or embryogenic callus and is substantially not present in non-embryogenic tissue.

9. A genetic construct of Claim 8, wherein the nucleic acid molecule is substantially as set forth in SEQ ID NO:1 or SEQ ID NO:3 or its complementary form, or a nucleotide sequence having at least about 71% similarity to SEQ ID NO:1 or SEQ ID NO:3 or its complementary form or a nucleotide sequence capable of hybridizing to SEQ ID NO:1 or SEQ ID NO:3 or its complementary form under low stringency conditions.

10. A genetic construct of Claim 8, wherein the nucleic acid molecule is developmentally regulated.

11. A genetic construct of Claim 8, 9 or 10, wherein the nucleic acid molecule is expressed substantially in embryogenic material of oil-palm plants or related plants but not in non-embryogenic material.

12. A genetic construct of Claim 8, wherein the nucleic acid molecule comprises a sequence of nucleotides substantially as set forth in SEQ ID NO:1 or SEQ ID NO:3.

13. A genetic construct of Claim 12, wherein the nucleic acid molecule comprises a sequence of nucleotides substantially as set forth in SEQ ID NO:1.

14. A genetic construct of Claim 12, wherein the nucleic acid molecule comprises a sequence of nucleotides substantially as set forth in SEQ ID NO:3.

15. A genetic construct of Claim 8 or 9, wherein said construct further comprises one or more promoter sequences or transcription termination sequences.
16. A genetic construct of Claim 15, wherein said construct further comprises one or more origins of replication and/or selectable marker gene sequences.
17. A vector comprising a construct of any one of Claims 8 to 16.
18. A host cell comprising a nucleic acid molecule encoding a polypeptide comprising an amino acid sequence substantially as set forth in SEQ ID NO:2 or an amino acid sequence having at least about 71% similarity to SEQ ID NO:2, wherein said polypeptide is present in plant zygotic embryos or embryogenic callus and is substantially not present in non-embryogenic tissue.
19. A host cell of Claim 18, wherein said nucleic acid molecule comprises a sequence of nucleotides substantially as set forth in SEQ ID NO:1 or SEQ ID NO:3 or its complementary form, or a nucleotide sequence having at least about 71% similarity to SEQ ID NO:1 or SEQ ID NO:3 or its complementary form or a nucleotide sequence capable of hybridizing to SEQ ID NO:1 or SEQ ID NO:3 or its complementary form under low stringency conditions.
20. A host cell of Claim 18, wherein the nucleic acid molecule is developmentally regulated.
21. A host cell of Claim 18, 19 or 20 wherein the nucleic acid molecule is expressed substantially in embryogenic material of oil-palm plants or related plants but not in non-embryogenic material.
22. A host cell of Claim 18, wherein the nucleic acid molecule comprises the nucleotide sequence substantially as set forth in SEQ ID NO:1 or SEQ ID NO:3.

23. A host cell of Claim 18, wherein the nucleic acid molecule comprises the nucleotide sequence substantially as set forth in SEQ ID NO:1.
24. A host cell of Claim 18, wherein the nucleic acid molecule comprises the nucleotide sequence substantially as set forth in SEQ ID NO:3.
25. A host cell of Claim 18, wherein the cell is a plant cell.
26. A plant cell of Claim 25, wherein the cell is from an oil-palm plant.
27. An isolated polypeptide or biologically-active fragment thereof or a variant or derivative of these, said polypeptide comprising the amino acid sequence set forth in SEQ ID NO:2 or an amino acid sequence having at least about 71% similarity to SEQ ID NO:2, wherein said polypeptide is present in plant zygotic embryos or embryogenic callus and is substantially not present in non-embryogenic tissue.
28. An isolated polypeptide of Claim 27, wherein the amino acid sequence is encoded by the nucleotide sequence substantially as set forth in SEQ ID NO:1 or SEQ ID NO:3 or a nucleotide sequence having at least about 71% similarity to SEQ ID NO:1 or SEQ ID NO:3 or its complementary form or a nucleotide sequence capable of hybridizing to SEQ ID NO:1 or SEQ ID NO:3 or its complementary form under low stringency conditions.
29. An isolated polypeptide of Claim 27, wherein the amino acid sequence is expressed substantially in embryogenic material of oil-palm plants or related plants but not in non-embryogenic material.
30. An isolated polypeptide of Claim 27 or 28, wherein the nucleotide sequence is substantially as set forth in SEQ ID NO:1.

31. An isolated polypeptide of Claim 27 or 28, wherein the nucleotide sequence is substantially as set forth in SEQ ID NO:3.
32. An isolated polypeptide of any one of Claims 27 to 31, wherein the polypeptide has antioxidant properties.
33. An isolated polypeptide of Claim 32, wherein the polypeptide is peroxiredoxin.
34. A method for producing a recombinant polypeptide in a host cell or tissue, said method comprising introducing into the said cell or tissue an expression vector comprising a nucleic acid molecule wherein said nucleic acid molecule comprises a sequence of nucleotides substantially as set forth in SEQ ID NO:1 or SEQ ID NO:3 or its complementary form, or a nucleotide sequence having at least about 71% similarity to SEQ ID NO:1 or SEQ ID NO:3 or its complementary form or a nucleotide sequence capable of hybridizing to SEQ ID NO:1 or SEQ ID NO:3 or its complementary form under low stringency conditions, wherein said nucleic acid molecule is operably linked to one or more regulatory sequences such that the nucleic acid molecule is capable of being expressed in said cell or tissue.
35. A method of Claim 34, wherein said expression vector comprises a genetic construct comprising a nucleic acid molecule comprising a sequence of nucleotides encoding an amino acid sequence substantially as set forth in SEQ ID NO:2 or an amino acid sequence having at least about 71% similarity to SEQ ID NO:2.
36. A method of Claim 34, wherein said nucleic acid molecule comprises a sequence of nucleotides substantially as set forth in SEQ ID NO:1 or SEQ ID NO:3.
37. A method of Claim 36, wherein said nucleic acid molecule comprises a sequence of nucleotides substantially as set forth in SEQ ID NO:1.

38. A method of Claim 36, wherein said nucleic acid molecule comprises a sequence of nucleotides substantially as set forth in SEQ ID NO:3.

39. A method for modulating apoptotic processes in a cell or tissue, said method comprising introducing into said cell or tissue an expression vector comprising a nucleic acid molecule, said nucleic acid molecule comprising a sequence of nucleotides substantially as set forth in SEQ ID NO:1 or SEQ ID NO:3 or its complementary form, a nucleotide sequence having at least about 71% similarity to SEQ ID NO:1 or SEQ ID NO:3 or its complementary form or a nucleotide sequence capable of hybridizing SEQ ID NO:1 or SEQ ID NO:3 or its complementary form under low stringency conditions wherein said nucleic acid molecule is operably linked to one or more regulatory sequences such that the nucleic acid molecule is capable of being expressed in said cell or tissue.

40. A method of Claim 39, wherein said expression vector comprises a genetic construct comprising a nucleic acid molecule comprising a sequence of nucleotides encoding an amino acid sequence substantially as set forth in SEQ ID NO:2 or an amino acid sequence having at least about 71% similarity to SEQ ID NO:2.

41. A method of Claim 39, wherein said nucleic acid molecule comprises a sequence of nucleotides substantially as set forth in SEQ ID NO:1 or SEQ ID NO:3.

42. A method of Claim 41, wherein said nucleic acid molecule comprises a sequence of nucleotides substantially as set forth in SEQ ID NO:1.

43. A method of Claim 41, wherein said nucleic acid molecule comprises a sequence of nucleotides substantially as set forth in SEQ ID NO:3.

44. A method for modulating apoptotic processes in a cell, said method comprising administering to said cell an apoptotic process-controlling effective amount of a recombinant polypeptide, said polypeptide comprising the amino acid sequence set forth in SEQ ID NO:2 or an amino acid sequence having at least about 71% similarity to SEQ

ID NO:2, said administration being for a time and under conditions sufficient to modulate apoptosis.

45. A method for detecting embryogenic plant material, said method comprising immobilizing a sample putatively containing RNA from the material to be screened on a solid support and contacting said immobilized RNA with a labelled nucleotide sequence capable of hybridizing to all or part of an mRNA transcript corresponding to the nucleotide sequence set forth in SEQ ID NO:1 or SEQ ID NO:3 or their derivatives or homologues as defined herein and then detecting the presence of said label.

46. A method of Claim 45, wherein said nucleotide sequence is substantially as set forth in SEQ ID NO:1 or SEQ ID NO:3.

47. A method of Claim 45, wherein said nucleotide sequence is substantially as set forth in SEQ ID NO:1.

48. A method of Claim 45, wherein said nucleotide sequence is substantially as set forth in SEQ ID NO:3.

49. An antibody to a polypeptide, said polypeptide comprising a sequence of amino acids substantially as set forth in SEQ ID NO:2 or an amino acid sequence having at least 71% similarity to SEQ ID NO:2, wherein said polypeptide is present in plant zygotic embryos or embryogenic callus and is substantially not present in non-embryogenic tissue.

50. An antibody of Claim 49, wherein the amino acid sequence is encoded by a nucleotide sequence substantially as set forth in SEQ ID NO:1 or SEQ ID NO:3 or a nucleotide sequence having at least about 71% similarity to SEQ ID NO:1 or SEQ ID NO:3 or its complementary form or a nucleotide sequence capable of hybridizing to SEQ ID NO:1 or SEQ ID NO:3 or its complementary form under low stringency conditions.

51. An antibody of Claim 49, wherein the amino acid sequence is encoded by a nucleotide sequence substantially as set forth in SEQ ID NO:1 or SEQ ID NO:3.
52. An antibody of Claim 49, wherein the nucleotide sequence is substantially as set forth in SEQ ID NO:1.
53. An antibody of Claim 49, wherein the nucleotide sequence is substantially as set forth in SEQ ID NO:3.
54. An antibody of Claim 49, wherein the polypeptide has antioxidant properties.
55. An antibody of Claim 54, wherein the polypeptide is peroxiredoxin.
56. A method for detecting a polypeptide which is indicative of the presence of embryogenic tissue in oil-palm or related plants, said method comprising contacting the tissue or an extract thereof with an antibody specific for said polypeptide or its derivatives or homologues for a time and under conditions sufficient for an antibody-polypeptide complex to form, and then detecting said complex.
57. A method of Claim 56, wherein the polypeptide comprises a sequence of amino acids substantially as set forth in SEQ ID NO:2 or an amino acid sequence having at least 71% similarity to SEQ ID NO:2.
58. A method of Claim 57, wherein the amino acid sequence is encoded by a nucleotide sequence substantially as set forth in SEQ ID NO:1 or SEQ ID NO:3 or a nucleotide sequence having at least about 71% similarity to SEQ ID NO:1 or SEQ ID NO:3 or its complementary form or a nucleotide sequence capable of hybridizing to SEQ ID NO:1 or SEQ ID NO:3 or its complementary form under low stringency conditions.

59. A method of Claim 56, wherein the amino acid sequence is encoded by a nucleotide sequence substantially as set forth in SEQ ID NO:1 or SEQ ID NO:3.

60. A method of Claim 56, wherein the amino acid sequence is encoded by a nucleotide sequence substantially as set forth in SEQ ID NO:1.

61. A method of Claim 56, wherein the amino acid sequence is encoded by a nucleotide sequence substantially as set forth in SEQ ID NO:3.

62. A pharmaceutical composition comprising the polypeptide having an amino acid sequence as set forth in SEQ ID NO:2 or a functional homologue thereof or a molecule having at least 71% similarity to SEQ ID NO:2 and one or more pharmaceutically-acceptable carriers and/or diluents.

63. A pharmaceutical composition of Claim 62, wherein the amino acid sequence is as set forth in SEQ ID NO:2.

64. A regenerated differentiated plant comprising a nucleic acid molecule encoding a polypeptide comprising an amino acid sequence substantially as set forth in SEQ ID NO:2 or an amino acid sequence having at least about 71% similarity to SEQ ID NO:2, wherein said polypeptide is present in plant zygotic embryos or embryogenic callus and is substantially not present in non-embryogenic tissue.

65. A regenerated differentiated plant of Claim 64, wherein nucleic acid molecule comprises a sequence of nucleotides substantially as set forth in SEQ ID NO:1 or SEQ ID NO:3 or its complementary form, or a nucleotide sequence having at least about 71% similarity to SEQ ID NO:1 or SEQ ID NO:3 or its complementary form or a nucleotide sequence capable of hybridizing to SEQ ID NO:1 or SEQ ID NO:3 or its complementary form under low stringency conditions.

66. A regenerated differentiated plant of Claim 64, wherein the amino acid sequence is encoded by a nucleotide sequence substantially as set forth in SEQ ID NO:1 or SEQ ID NO:3.

67. A regenerated differentiated plant of Claim 64, wherein the amino acid sequence is encoded by a nucleotide sequence substantially as set forth in SEQ ID NO:1.

68. A regenerated differentiated plant of Claim 64, wherein the amino acid sequence is encoded by a nucleotide sequence substantially as set forth in SEQ ID NO:3.

69. A regenerated differentiated plant of Claim 64, wherein the plant is an oil palm plant.